

A Guide to
SIZE & FREE AREAS
for

**PRESSED STEEL
GRILLES,
ALLUMINIUM
GRILLES &
REGISTERS**

**TECHNICAL
INFORMATION
& CLARIFICATION**



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In the interest of continuous development Johnson and Starley reserve the right to change specification without prior notice

Johnson and Starley prides itself on it's ability to supply spare parts quickly and efficiently. If your service engineer indicates a problem in obtaining a spare part, advise him to contact Johnson and Starley Spares Department.

1. PRESSED STEEL GRILLES

Pressed steel grilles have been widely used in the gas heating industry for many years both for the combustion air provision and for heater/boiler compartment relief ventilation at high and low level. (see BS 5440)

This type of grille was produced by a number of manufacturers and the 'free area' opening of these grilles differed from one to another.

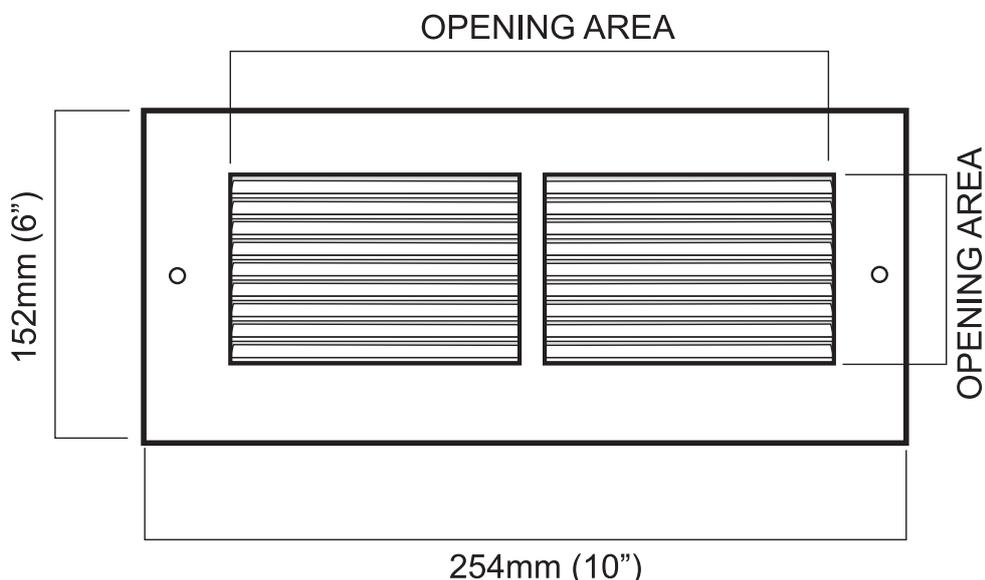
However, there has been some confusion with the 'rule of thumb' calculation for the free area of a given grille.

It has been widely accepted that the nominal free area of a grille was 70%.

This could be 70% of the overall grille size.

i.e. $25.4\text{cm} \times 15.2\text{cm} = 386\text{cm}^2 \times 70\% = 270\text{cm}^2$
($10\text{in} \times 6\text{in} = 60\text{in}^2 \times 70\% = 42\text{in}^2$) for some manufactures.

For other manufacturers the 70% free area was 70% of the louvered area only which could result in a figure of 60% of the overall grille size.



This had led to confusion with installers believing they had fitted the correct size grille only to find that it was undersize according to manufacturers instructions.

Having undersize grilles was not a major crisis as it was deemed to be NCS (not to current standards). However, since June 2008 the classification for undersized existing ventilation had changed from NCS to AR (at risk).

From 1st June 2008, all installations providing less than 90% of the ventilation requirement will be regarded as AR.

90% to 100% of the requirement is accepted under standards.

Where a defect(s) is identified with the ventilation and it is not possible to rectify it, reference should be made to the requirements of the current Gas Industry Unsafe Situations Procedure.

In certain situations, such as a compartment door being lined with asbestos, the existing hole cannot be increased, without specialist asbestos removed practices being employed and therefore it could be deemed as not possible to rectify it.

Note: *Providing that the asbestos is not disturbed its continuous use is still permitted.*

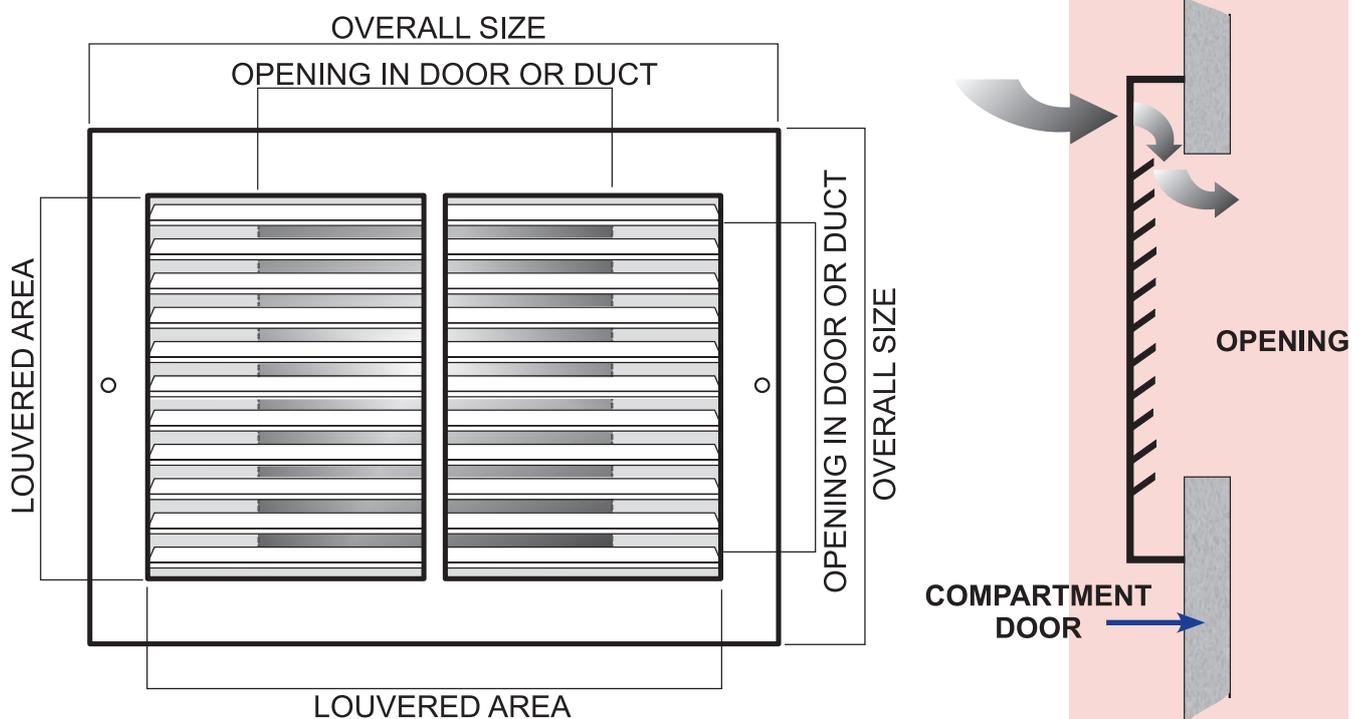
However, if the hole size in the door partition or compartment is adequate, a new Johnson & Starley grille with the rule of thumb 70% free area of the overall grille, with flanges deeper than that of the louver's can be used to provide the correct ventilation requirement. The grille stands proud of the door enabling an undersized grille covering an opening to be replaced with a correct free area grille without having to cut the door.

i.e. A compartment has a requirement for a high level grille with a free area requirement. 270cm².

A 25.4 cm x 15.2 cm hole was cut into the compartment door and covered with a 25.4 x 15.2 grille.

The measured free area of the existing grille is 230cm² therefore this is undersize by 40cm² and is now classified as AR.

The 25.4 x 15.2 hole is more than adequate for the requirement therefore a larger grille with the correct free area can be fitted over the hole and as the grille is proud of the door there will be no restriction to the airflow.



2. BALANCED COMPARTMENTS

A balanced compartment is a method of installing an open-flued appliance in a room sealed situation and arranging the flueing and ventilation so that a balanced flue effect is achieved. (see BS 5440)

This method was generally used in applications for larger appliances (35kW to 70kW) where room sealed appliances were generally not available. There were also a number of these applications used in the installation of warm air heating systems.

As this type of application is not generally used in new installations many engineers are not aware of their existence and have been known to put warning labels on them and/or turning off appliances as they have assumed that there is no ventilation to the compartment.

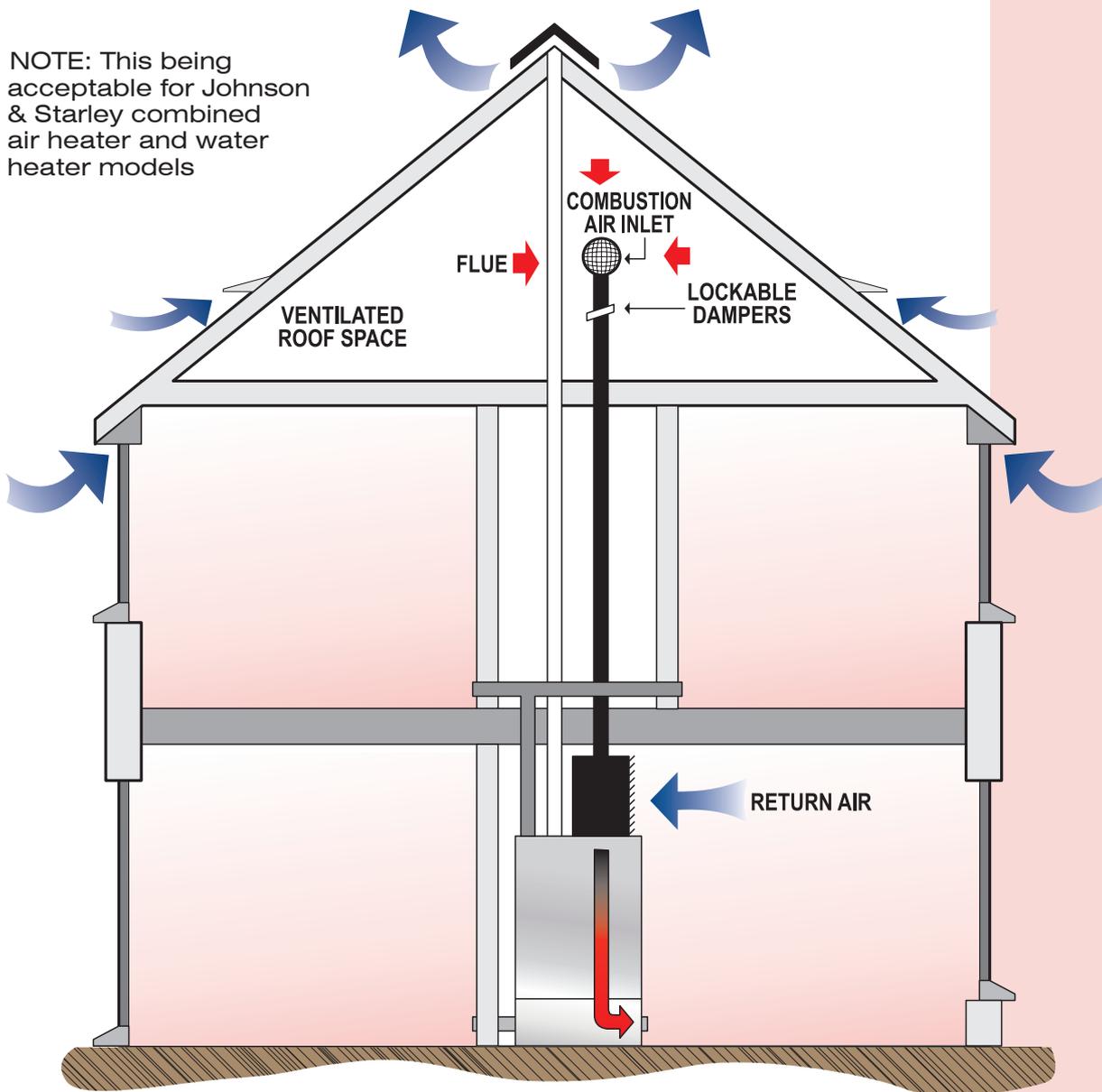
Many existing balanced compartment installations have been modified by adding high and low level compartment grilles into the door and, unwittingly, causing an at risk situation.

3. FAN ASSISTED PROVISION OF COMBUSTION AIR

This is an alternative method of providing combustion air for open-flued warm air heaters in tighter constructed dwellings, which often include draft and sound proofing materials. The method operated by drawing air from a ventilated roof space into the warm air ducting system and eliminated the need for openings in walls, doors or windows and reduced the risk of draughts. (see BS 5864).

When the warm air heater operates, its fan will draw in external air, mix it with the return air and circulate it throughout the warm air distribution ducts. Warm air should be circulated into the room / space where the air heater is installed using a non-closing register fitted in that area.

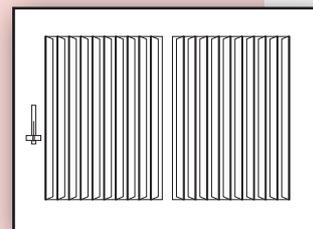
Where this method of air supply is used, reference should be made to the appliance manufacturer's installation instructions and BS 5864:2004 Installation and maintenance of gas-fired ducted air heaters of rated input not exceeding 70kw net (2nd and 3rd family gases) specification for further guidance.



There are several systems of this type fitted into dwellings and as not all engineers are familiar with this type of combustion air provision several appliances have been labelled or turned off incorrectly.

4. PRESSED STEEL REGISTERS 44R

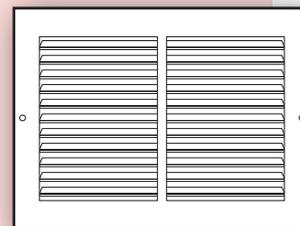
| ITEM NO | INCHES | mm | FREE AREA in ² | FREE AREA cm ² |
|---------|--------|-----------|---------------------------|---------------------------|
| 44R | 6 x 4 | 152 x 102 | 16.8 | 105 |
| 44R | 8 x 4 | 203 x 102 | 22.4 | 140 |
| 44R | 6 x 6 | 152 x 152 | 25.2 | 157.5 |
| 44R | 8 x 6 | 203 x 152 | 33.6 | 210 |
| 44R | 10 x 6 | 254 x 152 | 42 | 262.5 |
| 44R | 12 x 6 | 305 x 152 | 50.2 | 314 |
| 44R | 14 x 6 | 356 x 152 | 58.8 | 367.5 |
| 44R | 10 x 8 | 254 x 203 | 56 | 350 |
| 44R | 12 x 8 | 305 x 203 | 67.2 | 420 |
| 44R | 14 x 8 | 356 x 203 | 78.4 | 490 |



5. PRESSED STEEL GRILLES 33G "FREE AREA"

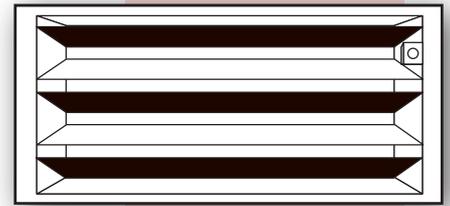
EQUIVALENT AREA (TO BS EN 13141-1:2004) ADD 9% TO FIGURES SHOWN BELOW

| ITEM NO | INCHES | mm | FREE AREA in ² | FREE AREA cm ² |
|---------|---------|-----------|---------------------------|---------------------------|
| 33G | 6 x 4 | 152 x 102 | 18.9 | 118.2 |
| 33G | 6 x 6 | 152 x 152 | 27.2 | 170.1 |
| 33G | 8 x 4 | 203 x 102 | 27.63 | 172.7 |
| 33G | 8 x 6 | 203 x 152 | 38.0 | 237.7 |
| 33G | 10 x 4 | 254 x 102 | 34.73 | 217.1 |
| 33G | 10 x 6 | 254 x 152 | 49.22 | 307.5 |
| 33G | 10 x 8 | 254 x 203 | 62.93 | 393.3 |
| 33G | 12 x 6 | 305 x 152 | 56.72 | 354.5 |
| 33G | 12 x 8 | 305 x 203 | 72.62 | 453.9 |
| 33G | 12 x 10 | 305 x 254 | 90.75 | 567.2 |
| 33G | 12 x 12 | 305 x 305 | 104.16 | 651 |
| 33G | 14 x 6 | 356 x 152 | 64.77 | 404.8 |
| 33G | 14 x 8 | 356 x 203 | 85.536 | 534.6 |
| 33G | 14 x 12 | 356 x 305 | 122.77 | 767.3 |
| 33G | 14 x 14 | 356 x 356 | 141.49 | 884.3 |
| 33G | 16 x 8 | 406 x 203 | 93.15 | 582.2 |
| 33G | 16 x 16 | 406 x 406 | 173.27 | 1082.9 |
| 33G | 18 x 12 | 457 x 305 | 151.57 | 947.3 |
| 33G | 18 x 16 | 457 x 406 | 204.34 | 1279 |
| 33G | 18 x 18 | 457 x 457 | 220.74 | 1379.6 |



6. ALUMINIUM OPPOSED BLADE BALANCING DAMPERS

| ITEM No. | INCHES | mm | FREE AREA in ² | FREE AREA cm ² |
|----------|--------|-----------|---------------------------|---------------------------|
| OBD | 6 x 4 | 152 x 102 | 17 | 109 |
| OBD | 8 x 4 | 203 x 102 | 22 | 145 |
| OBD | 6 x 6 | 152 x 152 | 25 | 162 |
| OBD | 8 x 6 | 203 x 152 | 34 | 216 |
| OBD | 10 x 6 | 254 x 152 | 42 | 270 |
| OBD | 12 x 6 | 305 x 152 | 50 | 325 |
| OBD | 10 x 8 | 254 x 203 | 56 | 361 |
| OBD | 12 x 8 | 305 x 203 | 67 | 433 |
| OBD | 14 x 8 | 356 x 203 | 78 | 506 |

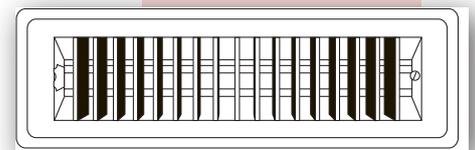


7. ALUMINIUM GRILLES & REGISTERS

| ITEM No. | INCHES | mm | FREE AREA in ² | FREE AREA cm ² | ITEM No. | INCHES | mm | FREE AREA in ² | FREE AREA cm ² |
|----------|---------|-----------|---------------------------|---------------------------|------------|---------|-----------|---------------------------|---------------------------|
| AG | 8 x 4 | 203 x 102 | 18 | 119 | AG 20 x 12 | 20 x 12 | 508 x 305 | 159 | 1025 |
| AG | 6 x 6 | 152 x 152 | 21 | 135 | AG 14 x 14 | 14 x 14 | 356 x 356 | 129 | 823 |
| AG | 8 x 6 | 203 x 152 | 29 | 189 | AG 12 x 16 | 12 x 16 | 305 x 406 | 126 | 812 |
| AG | 10 x 6 | 254 x 152 | 39 | 232 | AG 18 x 16 | 18 x 16 | 456 x 406 | 170 | 1097 |
| AG | 12 x 6 | 305 x 152 | 44 | 284 | AG 18 x 18 | 18 x 18 | 457 x 457 | 192 | 1238 |
| AG | 8 x 8 | 203 x 203 | 39 | 253 | AR 6 x 4 | 6 x 4 | 152 x 102 | 13 | 84 |
| AG | 12 x 8 | 305 x 203 | 60 | 387 | AR 8 x 4 | 8 x 4 | 203 x 102 | 18 | 116 |
| AG | 12 x 10 | 305 x 254 | 76 | 490 | AR 6 x 6 | 6 x 6 | 152 x 152 | 21 | 135 |
| AG | 14 x 10 | 356 x 254 | 98 | 613 | AR 8 x 6 | 8 x 6 | 203 x 152 | 29 | 187 |
| AG | 8 x 12 | 203 x 305 | 60 | 387 | AR 10 x 6 | 10 x 6 | 254 x 152 | 36 | 232 |
| AG | 12 x 12 | 305 x 305 | 93 | 600 | AR 12 x 6 | 12 x 6 | 305 x 142 | 44 | 284 |
| AG | 14 x 12 | 356 x 305 | 118 | 735 | AR 10 x 8 | 10 x 8 | 254 x 203 | 50 | 322 |
| AG | 16 x 12 | 406 x 305 | 126 | 812 | AR 12 x 8 | 12 x 8 | 305 x 203 | 60 | 387 |
| AG | 18 x 12 | 457 x 305 | 143 | 922 | AR 14 x 8 | 14 x 8 | 356 x 203 | 71 | 458 |

8. HEAVY DUTY STEEL FLOOR DIFFUSERS

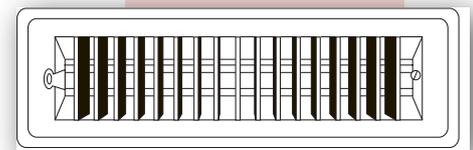
| ITEM No. | INCHES | mm | FREE AREA in ² | FREE AREA cm ² |
|----------|---------|-----------|---------------------------|---------------------------|
| FD | MINI | 245 x 57 | 8 | 50 |
| FD | 10 x 2¼ | 254 x 57 | 16 | 100 |
| FD | 12 x 2¼ | 305 x 57 | 18 | 116 |
| FD | 14 x 2¼ | 356 x 57 | 22 | 136 |
| FD | 10 x 4 | 254 x 102 | 27 | 177 |
| FD | 12 x 4 | 305 x 102 | 33 | 213 |
| FD | 14 x 4 | 356 x 102 | 39 | 248 |



BRONZE

9. STEEL CEILING DIFFUSERS

| ITEM | INCHES | mm | FREE AREA in ² | FREE AREA cm ² |
|------|---------|----------|---------------------------|---------------------------|
| CD | MINI | 254 x 57 | 8 | 50 |
| CD | 10 x 2¼ | 254 x 57 | 16 | 100 |
| CD | 12 x 2¼ | 305 x 57 | 18 | 116 |
| CD | 14 x 2¼ | 356 x 57 | 22 | 136 |



WHITE

10. FULL WIDTH GRILLE STRIP

| ITEM | INCHES | mm | FREE AREA in ² | FREE AREA cm ² |
|-------|--------|----------|---------------------------|---------------------------|
| GS262 | 26 x 2 | 660 x 50 | 17 | 109 |
| GS302 | 30 x 2 | 762 x 50 | 20 | 129 |



ALUMINIUM

